

A New Genus of Xystodesmid Milliped from Northern California¹

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The mountains of the California Coast Ranges and the foothills of the great Sierra Nevada Mountains abound with a prolific xystodesmid fauna. With few exceptions, the genera are allopatric, each one inhabiting a region of the mountains suitable to its climato-edaphic requirements. The presently described entity fills a significant gap in the almost continuous distribution of Xystodesmidae in northern California and occurs in the inner coast ranges of Colusa and Glenn Counties, where, to our knowledge, no xystodesmids have been taken previously. The most recent key to this family may be found in Loomis (1968). Closely related to *Wamokia* Chamberlin and *Xystocheir* Cook, *Anombrocheir* gen. nov., may be easily distinguished by the massive telopodite of the male gonopod which lacks secondary processes.

The holotype of *Anombrocheir spinosa* sp. nov., will be placed in the Arthropod Type Collection, University of California, Davis, and paratypes will be deposited in the Buckett-Gardner Collection, Davis, and the United States National Museum, Washington, D. C.

At present, no adequate key is available for the separation of California xystodesmid genera; therefore, below we present a key based primarily on the male. Female characters are used where known to be of value. Classification in the xystodesmids is based primarily on male sexual characteristics, thus our reason for predominantly using these characteristics in the key. In the sixth couplet, three genera are removed together because of the possibility of future synonymy.

KEY TO CALIFORNIA GENERA OF NYSTODESMIDAE

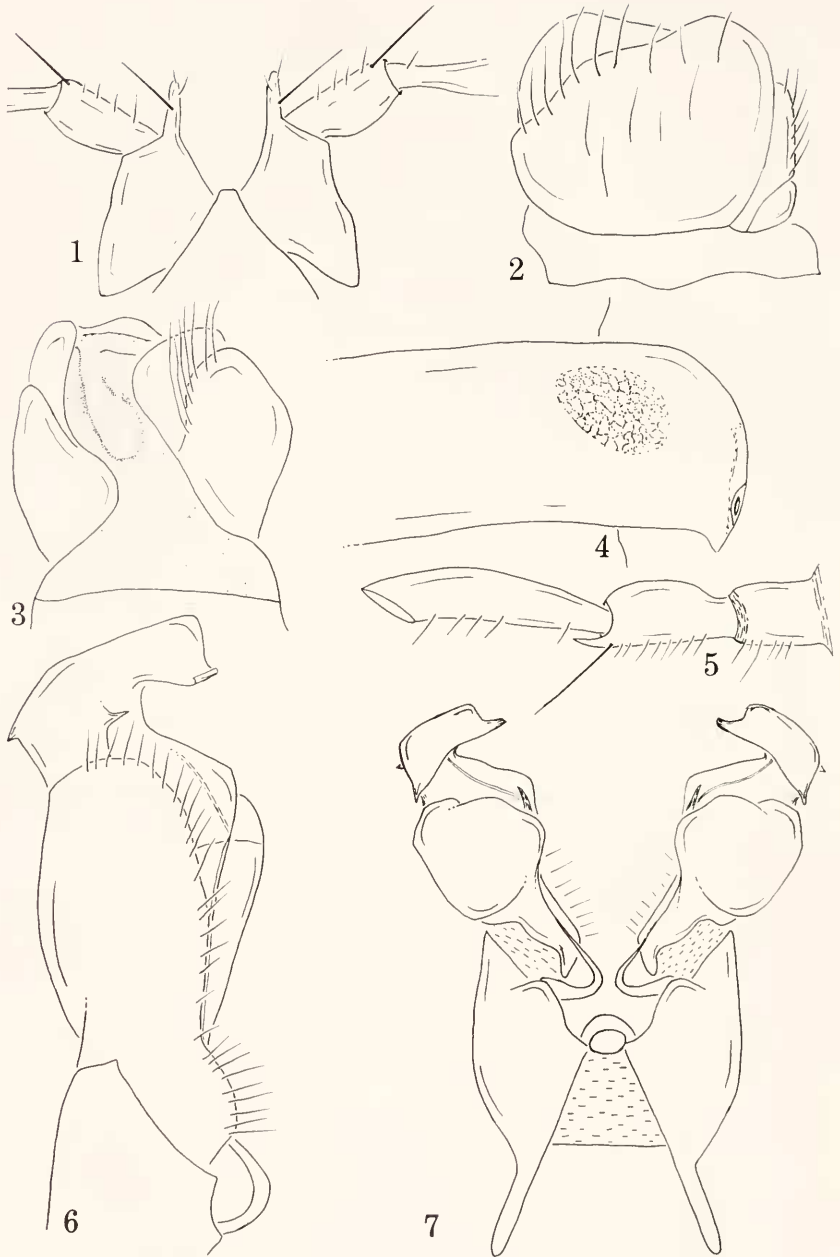
1. Male with pair of anterior processes on third coxae.....5
 Male lacking processes on third coxae.....2
2. Gonopods of male small, not joined together at coxae⁴; female
 lacking processes on second coxae.....3
 Gonopods of male prominent, joined with connecting tissue at
 coxae⁴; female with a pair of cylindrical processes on sec-
 ond coxae.....4
3. Male gonopods with telopodite composed of long, slender tibio-
 tarsus and short, slender femoral process.....**Hybaphe** Cook

¹ Diplopoda: Polydesmida: Xystodesmidae. Accepted for publication October 15, 1968.

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⁴ Gonopods must be removed to verify this character in certain species.



FIGS. 1-7. All Figures of *Anombrocheir spinosa* are drawn from specimens collected 3.5 miles north of Leesville, Colusa County, California. FIG. 1.—Paratype

- Male gonopods with tibiotarsus, femoral process, and definite lobate prefemoral process (see Buckett and Gardner, 1968, for illustrations).....**Harpaphe** Cook
4. Collum equal to or narrower than head.....**Motyxia** Chamberlin
Collum much wider than head.....**Sigmocheir** Chamberlin
5. Sternum between fourth pair of legs of male distinctly swollen or produced.....6
Sternum between fourth pair of legs of male flat or only slightly swollen.....7
6. Telopodite of gonopod with broad, blade-like lateral process and narrow, smaller mesal process.....**Paimokia** Chamberlin
Telopodite of gonopod divided into several apical processes.....
...**Xystocheir** Cook, **Delocheir** Chamberlin, **Cheirauxus** Chamberlin
7. Gonopod telopodite massive, a single piece extending cephalad beyond sixth pair of legs.....
.....**Anombrocheir** Buckett and Gardner, NEW GENUS
Gonopod telopodite divided into two or more slender processes.....8
8. Dorsa of segments with numerous, round tubercles; telopodite of male gonopods with forked lateral piece and heavy, entire mesal piece.....**Amplocheir** Chamberlin
Dorsa lacking tubercles; male gonopods with long, simple lateral piece, the mesal branch simple or complex.....**Wamokia** Chamberlin

Anombrocheir Buckett and Gardner, NEW GENUS

TYPE SPECIES: *Anombrocheir spinosa* Buckett and Gardner, new species.

DIAGNOSIS: Body averaging 25 mm in length and 5.0 mm in width; color a light yellowish-gray dorsally, with orange on tips of paranota and epiproct.

Head smooth and shining, with prominent coronal suture; antennae reaching back to fifth segment along paranotal margins.

Tergites smooth, paranota well developed, extending ventrolateral from mid-body height, with anterior lateral margin rounded and posterior corners acute, though not produced much caudad (see Fig. 4); collum narrow, about one-third as long as broad, with anterior margin curving evenly back, posterior corners equal to posterior margin of collum. Sterna low mesally, distinctly produced laterally, a transverse groove present between legpairs of each segment. Legs long, with femur extending beyond lateral margin of segment; leg segments unmodified except for moderate prefemoral spine; second and third legs of male each with a pair of cylindrical ventral processes; second legs of female with a prominent pair of elongate coxal projections.

female; sternum and proximal leg segments of second leg. FIG. 2.—Paratype female; cypnopod, anterior aspect. FIG. 3.—Paratype female; cypnopod, mesal aspect. FIG. 4.—Holotype male; right half of ninth segment, dorsal aspect. FIG. 5.—Paratype male; proximal three segments of right leg of twelfth segment. FIG. 6.—Paratype male; left gonopod, posterior aspect. FIG. 7.—Paratype male; gonopods, anterior aspect.

Gonopod socket large, sub-oval in shape, with posterior rim raised height of one coxal width; gonopods large, with coxae broad and joined together with a distinct sclerotized sternal connective which is surrounded by connective tissue and situated just distad of coxal muscles; telopodite joined to coxa distally by movable joint at oblique angle; prefemur-femoral region of telopodite subequal to coxa in size, without lobes or processes, surface slightly roughened and supporting many setae on posterior surface; tibiotarsal region narrowing abruptly, circled by several spines, apical portion produced mesad, terminating in a narrow, curved flange.

Anombrocheir spinosa Buckett and Gardner, NEW SPECIES

HOLOTYPE MALE: Coronal suture prominent, ending abruptly above antennal sockets, and with two prominent setae on each side; vertex smooth and shining, but etched with many minute transverse impressed striae; frontal and gular regions also marked by minute impressed striae; frons with a pair of setae dorsally between antennal sockets, a pair just below antennal sockets and separated by a distance equal to two-thirds the intersocket distance, and a row of 5 setae on each side near ventral margin of frons, with a distance equal to about two-thirds the interantennal area separating the inner most setae of each row; clypeus with a transverse row of 25 setae; labrum with a transverse row of 22 setae; gula with a broad, shallow groove parallel to lateral margin of facial shield; a distinct supra-antennal groove present; antennae moderate in length, reaching caudad to fifth segment along lateral margins of paranota, and separated by a distance equal to second antennal segment; first antennal segment cylindrical, not longer than width of socket, with two dorsal and two ventral sub-apical setae exceeding width of segment; second segment three times length of first, proximally half width of first, but apically equal to it in width, with numerous short setae along dorsal and ventral margins, and 4 long apical setae; segments three to five setose, equal in shape, cylindrical and narrower proximally; segment three subequal in length to two, segments four and five slightly shorter; segment six the longest segment, cylindrical, about two-thirds as wide at base as apex, and covered with fine setae; seventh segment sub-hemispherical, with four sense cones inset at apex.

Tergites smooth dorsally, except for many minute longitudinal impressed striae; lateral extensions of paranota with sub-cuticular reticulations, paranota projecting slightly ventrolaterad from mid-body height and each exceeding width of body cylinder by about thirty per cent of the cylinder; paranota slanted, with posterior margin about thirty degrees higher than anterior margin; collum with anterior margin broadly rounded, covering back of head; posterior corners of collum rounded, situated equal to posterior margin of segment; collum short, about one-third as long as broad; following seven segments with anterolateral corners increasingly rounded, posterior corners produced; segments eight to nineteen with anterolateral margins of paranota broadly rounded, with the posterior corners acutely rounded and produced slightly caudad of segment; repugnatorial pores opening on dorsal side of lateral margins of paranota and barely exceeded caudally by posterior margin of segment; segments seventeen to twenty progressively reduced, with segment nineteen greatly reduced, tergite narrower than distance between posterior corners of segment eighteen; epiproct subtriangular, with concave lateral margins and truncate apex with micro exceeding anal valves; epiproctal setae situated as follows: two pairs of paramedial dorsal setae close to mesal line, one about mid-length of segment, the other near apex, 3 setae along each lateral margin of tergite and 2 pairs of apical setae; anal valves roughened, anal lips produced and lined by 2 pairs of setae; hypoproct sublenticular, longer than half its width.

Sterna of first and second legs not exposed between closely adjacent coxae; third through seventh segments with intercoxal area of sternum becoming gradually wider; following segments with sterna finely wrinkled, low mesally, raised out from body cylinder laterally by one-third coxal width, a distinct transverse groove present between legpairs of each segment; pleural area smooth; anterior stigma of each segment elongate-oval, the posterior one subcircular and smaller.

Legs long and robust, femur exceeding lateral margin of paranota, coxae separated by slightly more than 2 coxal lengths; second coxa with small, rounded caudal process; third coxa with elongate, anteroventral process; normal legs with coxa short, slightly flattened, densely setose; prefemur about 1.3 times length of coxa and slightly broader, with a distinct ventral apical spine; prefemur very narrow basally, widening to 3 times basal width at apex, about 1.2 times length of prefemur; postfemur shorter and narrower than coxa, and tibia of same proportions, but shorter and narrower yet; tarsus sub-cylindrical, more densely setose than previous segments, subequal in length to prefemur, with a large, slightly curved claw equal to almost half the length of tibia; femur and tarsus becoming exaggerated in length near posterior end of body, tarsus subequal to previous two segments in length and femur almost twice length of tarsus.

Gonopod socket suboval in shape, with a low anterior rim and raised posterior rim, socket extending to two-thirds length of prozonite, posteriorly to four-fifths of metazonite, and in width slightly narrower than distance between lateral margins of eighth coxal bases.

Gonopods very large, telopodites produced cephalad to anterior margin of fifth segment; coxae erect, longer along lateral margin than along mesal margin, with a short apophysis projecting baso-laterad from mesal margin; anteriorly, coxae joined at apex of mesal margins by a small, circular sternal remnant and a translucent band of connective tissue caudad of the sternum; coxae connected posteriorly by abundant transverse muscle tissue; telopodite joined to coxa by movable linge which flexes longitudinally, permitting a vertical- or anterior-facing position of the telopodite; prefemur-femur as wide as coxa at hinged joint, then broadening distally until much exceeding coxa in width and equalling it in length; prefemur long-setose caudally, with an even row of equal setae extending up mesal margin and lining distal margin on posterior side, surface of the prefemur-femur being minutely roughened, not shining; beyond prefemur-femur, telopodite abruptly narrowing to half its former width, the distal portion curving mesad with apex truncate; at point where narrowing occurs, 3 prominent spines, anterior, lateral and posterior encircle telopodite; a longitudinal flange occurring mesally on posterior side of femur, cephalad of distal margin of which a large spine is based, the spine exceeding distal margin of femur on anterior face; apex of telopodite with a thin flange produced and curling distad on posterior side; solenite emerging distally on anterior face of coxa medially between lateral and mesal margins, inserting in seminal canal on prefemur mesally, the canal proceeding along mesal margin of femoral flange for about half its length, then to anterior side of flange, continuing to apical extremity and opening on mesal margin of apical flange near its anterior margin.

FEMALE: As in male except for sex characteristics. Second coxae with a pair of seta-bearing ventral processes. Cyphopod aperture oval, with a large median constriction on posterior margin; cyphopods extremely wide, almost ovoid in shape, with a broad groove on posterior margin and valves barely exceeding receptacle.

SPECIMENS EXAMINED: CALIFORNIA: Holotype male, 3.5 miles north of Leesville, Colusa County, 22 December 1965 (J. S. Buckett, M. R.

& R. C. Gardner). Paratypes: Colusa County: 13 males, 5 females, same data as holotype; 9 males, 14 females, same locality as holotype, 23 March 1968 (J. S. B. & M. R. G.); Glenn County: 26 males, 8 females, 3.3 miles north of Grapevine Pass, 23 March 1968 (J. S. B. & M. R. G.).

DISCUSSION: Specimens from 3.3 miles north of Grapevine Pass differ from the holotype in the anterior sub-apical spine of the gonopod being much the largest, exceeding others in the ring by 2 times their size; also, the apical region of the telopodite exhibits a more pronounced distal hump, the apical flange not being perpendicular to the telopodite, as the posterior margin is proximad of the anterior. Specimens from 3.5 miles north of Leesville resemble the condition found in the Grapevine Pass specimens. Non-geographic variation is found in the number of sub-apical spines on the gonopod, with as many as five subequal spines present on the lateral face.

Anombrocheir has been found in the rainshadow region of the inner coast ranges of northern California. The known range of *A. spinosa* spans about 25 miles in its greatest dimension, greater than the known range of any of the species of *Wamokia*, a close relative which inhabits similarly dry terrain in the Sierran Foothills (see Buckett & Gardner, in press). Presently it seems that *Anombrocheir* is probably not splintered into a number of localized species as is *Wamokia*, although further collecting must be carried out to confirm this hypothesis. No explanation can be given for this apparently great genetic stability at this time.

Anombrocheir appears to be allopatric with all other xystodesmids. Specimens of *Xystocheir* have been collected 40 miles south of the southern collection of *Anombrocheir*, and specimens of *Harpaphe* over sixty miles to the north, both other genera in very different habitats.

The habitats occupied by *spinosa* all lie in areas with average annual rainfall of about 20"-22". The specimens were found in areas where accumulated leaf litter was thickest (about one inch), although it was only slightly moist. The major components of the litter were leaves from *Quercus douglasii* H. & A., although *Pinus sabiniana* Dougl. also influenced the habitat. Specimens were also found in the litter under a bush of *Adenostoma fasciculatum* H. & A., in an area where the population of *spinosa* was large.

Anombrocheir is closely related to the group of genera including *Xystocheir*, *Cheiraxrus* Chamberlin, *Delocheir* Chamberlin, *Wamokia*, *Amplocheir* Chamberlin, and *Painokia* Chamberlin. The genera in this group possess the common features of the gonopod coxae being bound tightly together with connective tissue and muscle, a distinct, sclerotized sternum, the telopodite joined to coxa by a movable hinge, the second and

third legs of the male with cylindrical coxal processes, and second leg of female with a cylindrical coxal process.

Of these related genera, *Xystocheir* and *Wamokia* appear to be the closest relatives of *Anombrocheir*. Though *Xystocheir* is the nearest genus geographically, *Anombrocheir* differs from it by lacking tubercles on the dorsum, by possessing a shorter, more evenly oval gonopod aperture, lacking sternal swellings on the pregenital segments, and by the obsolescence of the apical processes of the telopodite of the gonopods. *Wamokia*, on the other hand, resembles *Anombrocheir* in all these characters, as well as inhabiting terrain as dry as that which supports the latter. *Anombrocheir* does differ from *Wamokia*, however, by possessing a broader body (length/width ratios in male of 5.3–6.9 for *Wamokia* vs. 5.0–5.2 for *Anombrocheir*) with a disproportionately greater separation of the pregenital legs, as well as a much more massive telopodite of the gonopod. From the above comparisons, we conclude that *Wamokia* is the genus most closely related to *Anombrocheir*.

LITERATURE CITED

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(THE ENTOMOLOGIST'S RECORD, continued from p. 66)

Nomenclature Notice.—Possible use of plenary powers by the International Commission on Zoological Nomenclature is announced for the following cases pertaining to insects and spiders, the case number in parenthesis: (see Bull. Zool. Nomencl. 25, pt. 2/3, 27 September 1968), Arachnida (1838) type-species for *Oligolophus* C. Koch, 1872; Hemiptera (1843) validation of *Aphis gossypii* Glover, 1877; Hymenoptera (1845) type-species for *Anoplus* Dufour, 1834; Hymenoptera (1845) neotype for *Sphex niger* Fabricius, 1775, and *Sphex nigerrimus* Scopoli, 1763; Hemiptera (1852) suppression of *Siphocoryne angelicae* del Guercio, 1911, and Lepidoptera (1853) validation of emendation to *Hypsmocoma* of *Hypsmochoma* Butler, 1881. Send comments in duplicate, citing case number, to the Secretary, International Commission of Zoological Nomenclature, c/o British Museum (Natural History), Cromwell Road, London, S.W. 7, England.—W. E. CHINA, Assistant Secretary.